# WELDING PROCEDURE SPECIFICATION

**WPS -** 3003-1 **REV. NO.:** 0 **DATE:** 10/6/2004 ****APPLICABILITY****

**WELDING PROCESS/ES:** GMAW-SC **and** GMAW-SC **ASME:** X **AWS:** X

**SUPPORTING PQR:** P-WS-174-1 P-WS-202-1 P-WS-204-1 **OTHER:**

P-WS-73-1 P-WS-70-2 P-WS-70-1 Z-WS-4-D

**JOINT** **This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.**

**Weld Joint Type:** Groove/fillet **Class:** Full/partial penetration

**See GWS 1-06 for joint details** **Preparation:** Mechanical/thermal

**Root Opening:** 1/16"-3/32" **Backing:** With/without

**Backgrind root:** Root if reqd. **Backing Mat.:** CS strap/ring if used

**Bkgrd Method:** Grind/chip **GTAW Flux:** N/A **Backing Retainer:** N/A

**FILLER METALS:** **Class:** ER-70S-x **and** ----------

**A No:** 1 **SFA Class:** 5.18 **and** ---- **F No:** 6 **and** ---- **Size:** .035 0 0 0

**Insert:** N/A **Insert Desc.:** N/A **Weld Metal Thickness Range:**

**Flux: Type:** N/A **Size:** N/A **AWS:** 0.062 **thru** 2.000

**Filler Metal Note:** **ASME:** 0.062 **thru** 2.000

**BASE MATERIALS:** **P No.** 1 **Gr No.** 1 **to: P No.** 1 **Gr No.** 2

**Spec.** Steel&Steel Alloys **Grade:** All **to: Spec.** Steel&Steel Alloys **Grade:** All

**Qualified Pipe Dia Range: = :** 1.5

**Qualified Thickness Range:** **AWS:** 0.062 **thru** 2.000 **ASME:** 0.062 **thru** 2.000

**QUALIFIED POSITIONS:** Plate-all Pipe-all **Vertical Progression:** V-UP

**Preheat Min. Temp.:** *70 **°F** **GAS: Shielding:** Ar/CO2 **or** ----------

**Interpass Max. Temp.:** 500 **°F** **Gas Composition:** 75 **%** 25 **%** 0 **%**

**Preheat Maintinance:** *70 **°F** **Gas Flow Rate cfh:** 15 **to** 35

**Backing Gas/Comp:** N/A 0 **%**

**PWHT: Time @ °F Temp.** N/A **Backing Gas Flow cfh:** 0 **to** 0

**Temp. Range:** 0 **°F** **to** 0 **°F** **Trailing Gas/Comp:** N/A **%**

**PREPARED BY:** KG Fellers **DATE:** 10/6/2004

Signature on file at FWO-DECS

**APPROVED BY:** Tobin oruch **DATE:** 10/6/2004

Signature on file at FWO-DECS

## Note:For SC/SS/ML-1/ML-2 work, this WPS requires independent review.

**WPS NO: 3003-1**

**WELDING CHARACTERISTICS:**

**Current:** DCEP **and** ---- **Tungsten type:** N/A **Transfer Mode:** Globular

**Ranges: Amps** 80 **to** 140 **Pulsing Cycle:** N/A **to** N/A

**Volts** 12 **to** 21 **Background Current:** N/A

**Fuel Gas:** N/A **Flame:** N/A **Braze temp. °F** 0 **to** 0

**WELDING TECHNIQUE:** **For cleaning, grinding, and inspection criteria refer to Volume 2, Welding Fabrication Procedures**

**Technique:** Semi-auto **Cleaning Method:** Grind/chip/arc gouge

**Single Pass or Multi Pass:** M **Stringer or Weave bead (S/W):** S **Oscillation:** N/A

**GMAW Gun Angle °:** 5 **to** 15 **Forehand or Backhand for GMAW (F/B):** FH

**GMAW/FCAW Tube to work distance:** 1/2"-5/8"

**Maximum K/J Heat Input:** N/A **Travel speed:** As reqd. **Gas Cup Size:** 1/2"-5/8"

**No single pass shall deposit greater than 1/2" thickness of material.**

**PROCEDURE QUALIFIED FOR:**

**Charpy "V" Notch:** N/A **Nil-Ductil Transition Temperature:** N/A **Dynamic Tear:** N/A

**Comments:** (1) *IPT and Preheat for material =3/4" = 225 °F min.

| Weld Layer | Manual Process | Filler Metals | Size | Amp Range | Volt Range | Travel/ipm | Nozzel Angle | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | GMAW-SC | ER-70S-x | .035 | 80 **to** 120 | 12 **to** 18 | 5 **to** 12 | 5 - 15 | |
| 2 | GMAW-SC | ---------- | 0 | 100 **to** 140 | 19 **to** 21 | 10 **to** 20 | | |
| 3 | | | | | | | | |
| 4 | GMAW-SC | ---------- | 0 | 180 **to** 220 | 22 **to** 28 | 10 **to** 20 | | |
| 5 | | | 0 | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |

**REM.** *** Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.**

**Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.**